



Scaling Energy Access with Blended Finance

SunFunder and the Role of Catalytic Capital



Executive Summary

- More than a billion people still live without access to electricity, presenting a challenge to socioeconomic development across low- and middle-income countries. However, in regions like sub-Saharan Africa, it is becoming clear that distributed off-grid solar systems can help solve this problem. A key challenge for wide-scale deployment of these technologies is that they require innovative forms of financing.
- The off-grid solar sector presents a ready investment opportunity for interested investors; but the sector still faces a lack of commercially scalable debt financing. To help address this, specialist financial intermediaries like SunFunder can play a crucial role in developing viable investment structures and aggregating investor capital.
- SunFunder has demonstrated a successful model for unlocking investor capital toward this sector, having raised more than \$62m in debt funds by the start of 2018, all the while maintaining a 100 percent repayment rate to investors.
- Catalytic capital from foundations and impact investors such as the DOEN Foundation, Facebook, The Rockefeller Foundation and The David and Lucile Packard Foundation has been critical to helping SunFunder's investment vehicles scale and attract institutional investors. Through their willingness to bear upfront risks, for instance, Facebook and The Rockefeller Foundation's junior investments in the Beyond the Grid Solar Fund catalyzed 11 times the investments in more senior capital positions in the fund.
- The long-term potential of commercially deployed solar energy access ultimately requires the sector, and the intermediaries and investors serving it, to offer structures that will mobilize large-scale institutional capital. Drawing on the experience from its current funds and more recent engagements with future investors, SunFunder presents some considerations for moving forward with new partnerships.

“Since 2012, we’ve been figuring out how to create new kinds of investment products for the energy access sector. By blending together catalytic capital with private and development finance, we think scaling the SunFunder model with institutional investors is just around the corner.”

Ryan Levinson, SunFunder founder and CEO

Energy Access: An Investment Opportunity

More than 1bn people still live without electricity, predominantly in rural areas, and over half of them live in sub-Saharan Africa. UN Sustainable Development Goal #7 is aimed at addressing this gap and ensuring access to affordable, reliable, sustainable and modern energy for all, but progress has fallen far short of what is needed to achieve it. Part of accelerating that progress lies in finding new and innovative models of financing: UN Sustainable Energy for All estimates that \$45bn per year is needed to achieve universal electrification globally, but less than half that is currently being deployed, and only 1 percent to decentralized solutions that can deliver energy access quickly and affordably to the world's poorest people.¹

In recent years, the falling costs of solar generation, battery storage and efficient appliances have enabled the emergence of a new ecosystem of commercial enterprises that deliver off-grid solar energy access solutions in developing countries. In 2017, these enterprises were providing improved electricity access to an estimated 73m households comprising over 360m people, with 130m solar devices sold since 2010, generating sales of over \$3.9bn.² At the same time, there is an estimated potential market of 434m households, leaving significant opportunity for market growth as well as value addition from follow-on goods and services that deliver further socioeconomic impact.

The Working Capital Financing Gap

The off-grid solar sector is emerging as an investment success story, with over \$550m deployed in the last two years alone. However, until recently impact capital and other early stage equity was much more readily available than debt for scaling up. Working capital debt has been, and remains, an obstacle for off-grid solar companies year after year.

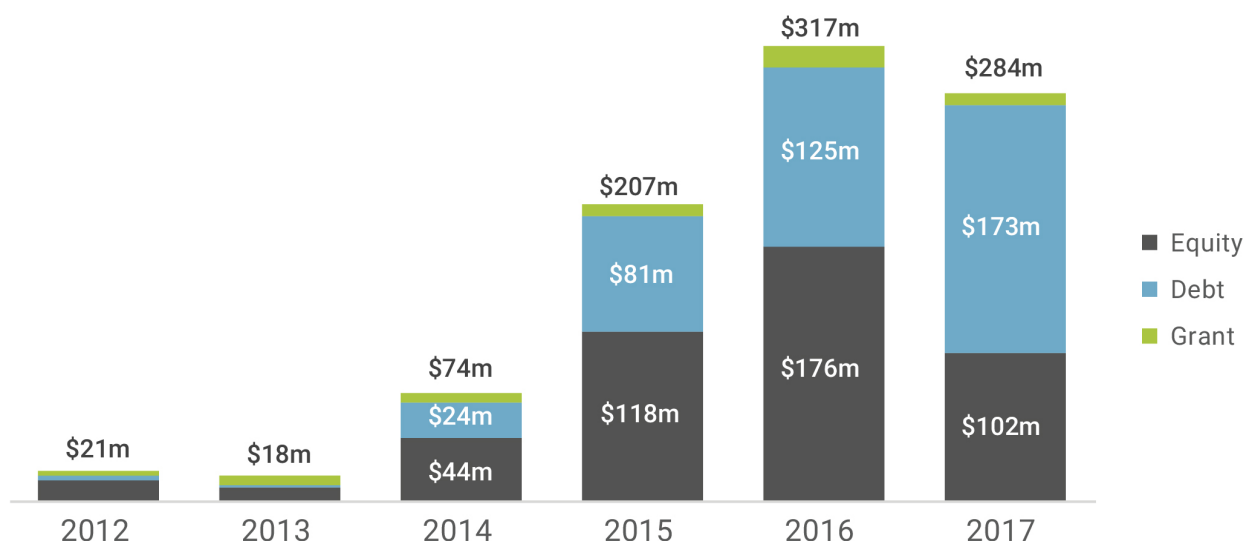


Figure 1: Off-grid investments by type, 2012-17. Source: GOGLA data

¹ See [UN Sustainable Energy for All's Energizing Finance 2017](#).

² See [Lighting Global/GOGLA Off-Grid Solar Market Trends Report 2018](#), which provides a comprehensive market overview.

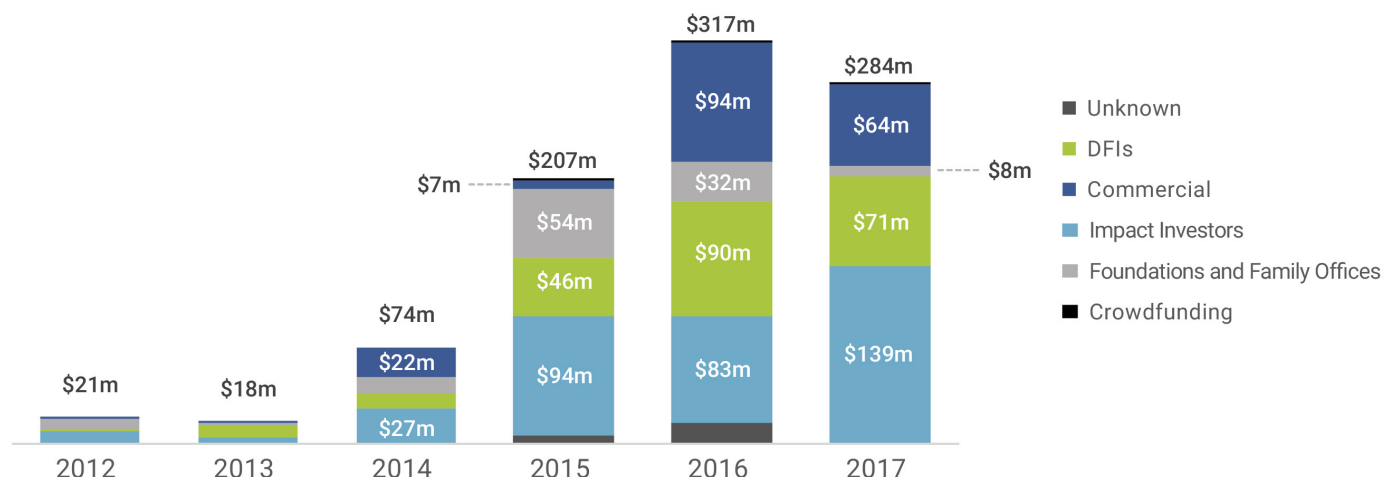


Figure 2: Off-grid investments by investor, 2012-17. Source: GOGLA data

While recent growth has been encouraging, 2017 was the first year that more debt than equity was deployed in the sector. This is due both to increased attention from traditional development finance institutions (DFI) and to the expansion of specialist intermediaries.

These intermediaries—foremost among them SunFunder, responsAbility's Energy Access Fund and SIMA, as well as broader investors Global Partnerships, Oikocredit and Developing World Markets—are actively lending capital to impactful enterprises across the sector, and beginning to tackle the capital gap which prevents scale.

In doing so, they have developed differentiated investment products to channel capital into the sector. These products have evolved over time, providing important lessons on how to efficiently allocate and scale investments in energy access markets.

This paper focuses on lessons from SunFunder's experience having unlocked over \$62m by the end of 2017 through a series of innovative aggregated debt funds which have offered investors a route into the sector. Funds have been used to deploy loans to 37 solar companies—including industry leaders like Greenlight Planet, d.light and Off-Grid Electric—through over 100 beyond-grid solar transactions, primarily in sub-Saharan Africa, directly resulting in improved energy access for more than 3m people.

Matching Capital to Impact: SunFunder's Debt Funds

CEO Ryan Levinson founded SunFunder in 2012 to address the key obstacle facing off-grid entrepreneurs: a lack of scalable debt financing. Initially launched as a crowdfunding platform, SunFunder raised nearly \$450,000 from 1,000+ unaccredited investors in its first year. This allowed funds to quickly mobilize and SunFunder to make its first small loans, including several that subsequently emerged as industry leaders, such as SolarNow and Fenix, and the largest distributor of pico-solar products at the time, SunnyMoney.

Private Debt Offerings

Shortly after the initial crowdfunding phase, SunFunder began looking to larger sources of capital. Demand from solar companies for financing was far exceeding supply, while the timing constraints of crowdfunding meant less flexibility in tailoring loans for borrowers.

In response, SunFunder piloted a new 18-month private debt offering, the first Solar Empowerment Note, in 2013, raising \$250,000 from four investors. Half of that came from the DOEN Foundation in the Netherlands, an early leader in innovative energy access funding more widely, which was SunFunder's first non-individual investor. The other three additional investments were existing SunFunder seed-stage equity investors willing to partner and experiment on a new idea.

This pilot was a marked success: The capital raised was deployed to seven solar borrowers, which included BBOX along with new loans to SolarNow, Fenix and others. All four investors received 100 percent repayment, on time and with interest.

Tiered Capital Structure

Building on this track record, SunFunder launched a larger, longer-term debt product in 2014, raising \$1.1m through two-year notes in its new Solar Empowerment Fund (SEF) by high net worth individuals (HNIs) and impact investors. Notably, this first SEF note included a modified capital structure that SunFunder identified as key to reducing risk for senior investors and unlocking capital: a 15 percent first-loss junior layer, which offered a higher return. The majority of this junior layer was funded by a single HNI, with SunFunder itself contributing the balance.

In early 2015, SunFunder significantly expanded lending, raising over \$3m over two notes from a mix of HNIs and impact investors, including Treehouse Investments. With greater track record helping to lower investors' risk perception and longer-tenor loans being demanded by its solar borrowers, SunFunder was able to raise three-year debt capital in the new round.

Both those investor notes were again predicated on a 15 percent first-loss junior capital layer. However, there was limited appetite from investors to participate at this level, even with significantly higher interest, as the sector was still too young. SunFunder was forced to put up the whole amount itself.

Then in mid-2015, SunFunder launched a three-year note, but at \$3.6m it was a step up in size and SunFunder alone could not provide the first-loss capital needed. The DOEN Foundation proved to be an innovative partner, investing \$500,000 in the higher-interest bearing junior layer alongside a smaller HNI investment. This risk protection enabled SunFunder's first large-ticket investor, Calvert Impact Capital, to make a \$2m senior investment. The increase in size meant disbursements could now include a larger facility for d.light, among others, and the first pay-as-you-go solar receivables financing through SunFunder's structured asset finance instrument (SAFI) with SolarNow.

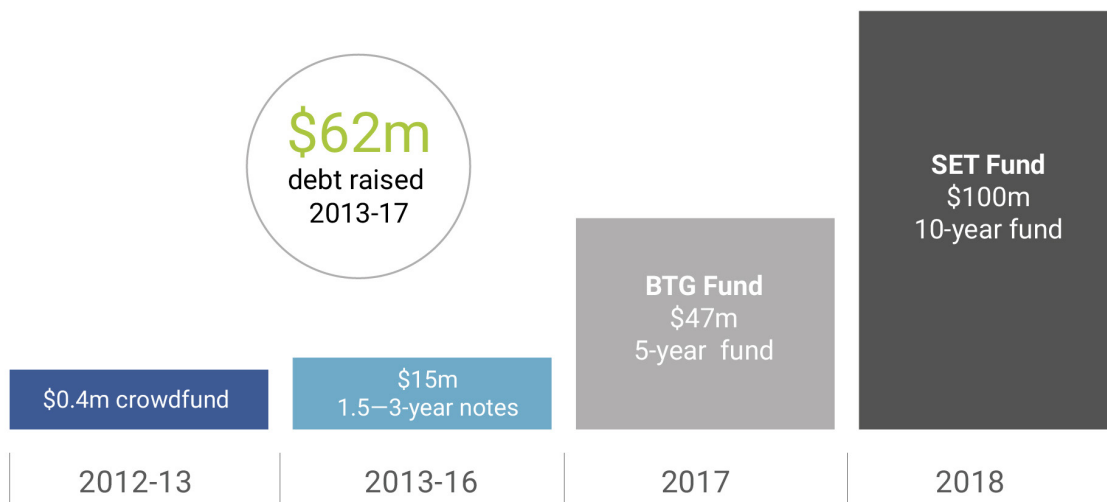


Figure 3: SunFunder debt fund evolution

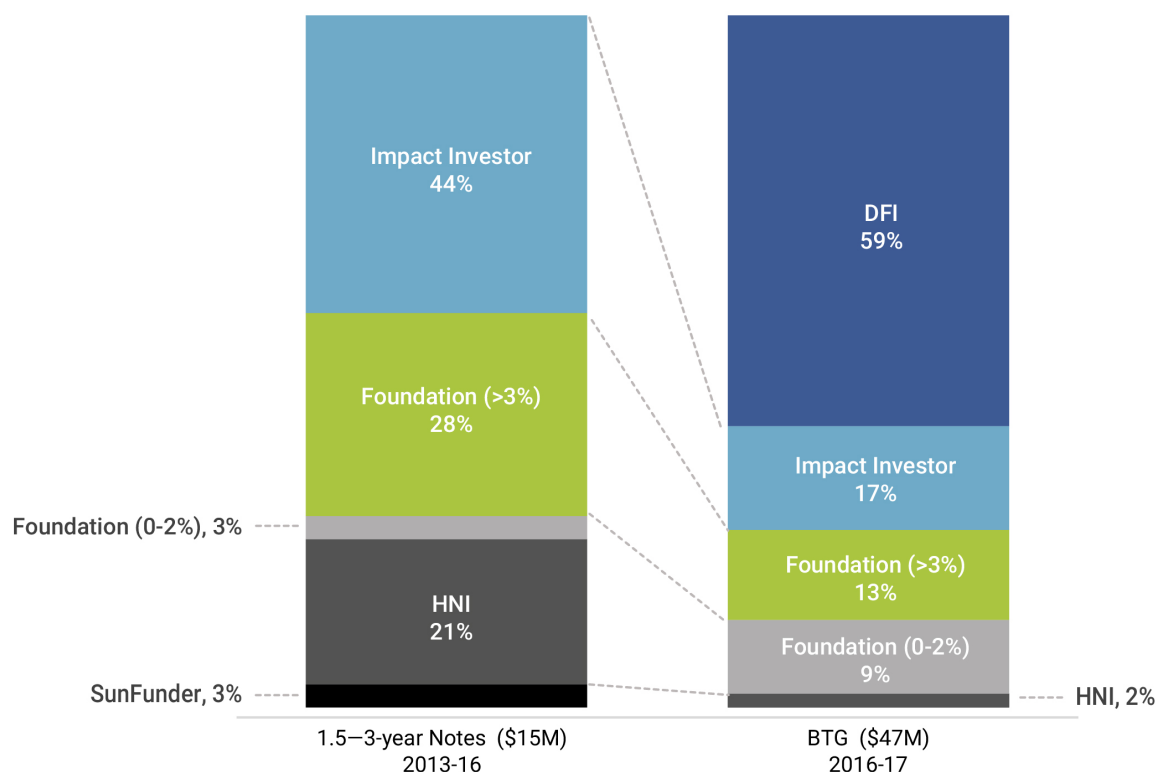


Figure 4: SunFunder debt investor evolution

Unlocking Larger Amounts with Catalytic Capital

By the start of 2016, SunFunder had closed \$8.5m in private debt offerings, demonstrating its ability to manage a steady increase in capital committed and deployed, and consistently repay debt investors on time. The next three-year note, launched in early 2016 at \$7m, saw further innovation to unlock larger amounts of capital.

SunFunder first introduced a mezzanine layer—where investors could take more risk than senior while still retaining some risk protection. Facebook then provided SunFunder with its first significant grant, for investment as junior capital to catalyze other investors.

Facebook's participation was particularly innovative in its revolving structure. The capital was provided as a grant, but structured to minimize distortion of the fund's performance. The grant was invested into the junior layer with a defined return, and at fund dissolution, both principal and return are slated for further reinvestment as a risk-mitigation instrument for new funds.

This funding then unlocked 27 mezzanine investors made up of HNIs, impact investors and a foundation, which in turn enabled The Packard Foundation to make a \$3.5m senior commitment—becoming SunFunder's second large-ticket investor.

From Private Notes to Structured Funds

The Beyond the Grid Solar Fund (BTG) was launched in late 2016 and also utilized a three-tier structure supported by a majority senior investor. The first close of \$21m in October 2016 was led by a \$15m senior investment by US development finance institution OPIC—SunFunder’s first development finance institution investor—alongside MCE Social Capital in the mezzanine layer and The Rockefeller Foundation as junior. OPIC was followed into the senior layer by the Dutch and Belgian development finance institutions, FMO and BIO, as well as previous impact investor Baldwin Brothers. The Packard Foundation and the Sant Foundation took innovative positions by investing in both the senior and mezzanine tranches to diversify their risk and return. Other mezzanine investors included eight HNIs (with minimum tickets of \$100,000) alongside impact investor Anthos and the Leonardo DiCaprio Foundation. BTG closed at \$47m.

However, junior capital was again a challenge for BTG’s second close. While The Rockefeller Foundation initially took a larger, interest-bearing part, a \$1m grant by Facebook—building on their catalytic role in the last note series—was critical for the fund’s risk profile. With the size of BTG, SunFunder was able to deploy solar loans averaging \$1.2m as of the start of 2018, with larger facilities in the pipeline. The company’s debt offerings have grown in lockstep with the sector more widely, helping to fuel the growth of the early off-grid solar pioneers it started small and scaled with.

Following BTG, SunFunder has started raising a new \$100m Solar Energy Transformation (SET) Fund, which will again present a significant opportunity to investors with a range of profiles—and continue to enable institutional investment for energy access.

Blending and Catalyzing Capital: Lessons and Considerations from SunFunder's Approach

In the course of unlocking over \$62m for the energy access sector through innovative investment products, SunFunder has experimented with and learned from several approaches which could serve the industry widely.

Building Track Record to Blend In Different Kinds of Investors

A key part of the debt fund strategy has been to offer different investors, with varying risk appetites, a route into the energy access sector. The profiles of these investors have changed over time as SunFunder built its track record and the sector matured more generally. HNIs taking riskier positions earlier allowed foundations and impact investors to take them later. Similarly, foundations and impact investors paved the way for public institutional investment by DFIs, which accounted for 86 percent of BTG's senior layer. SunFunder's own capital was required to initiate the first riskier junior layers.

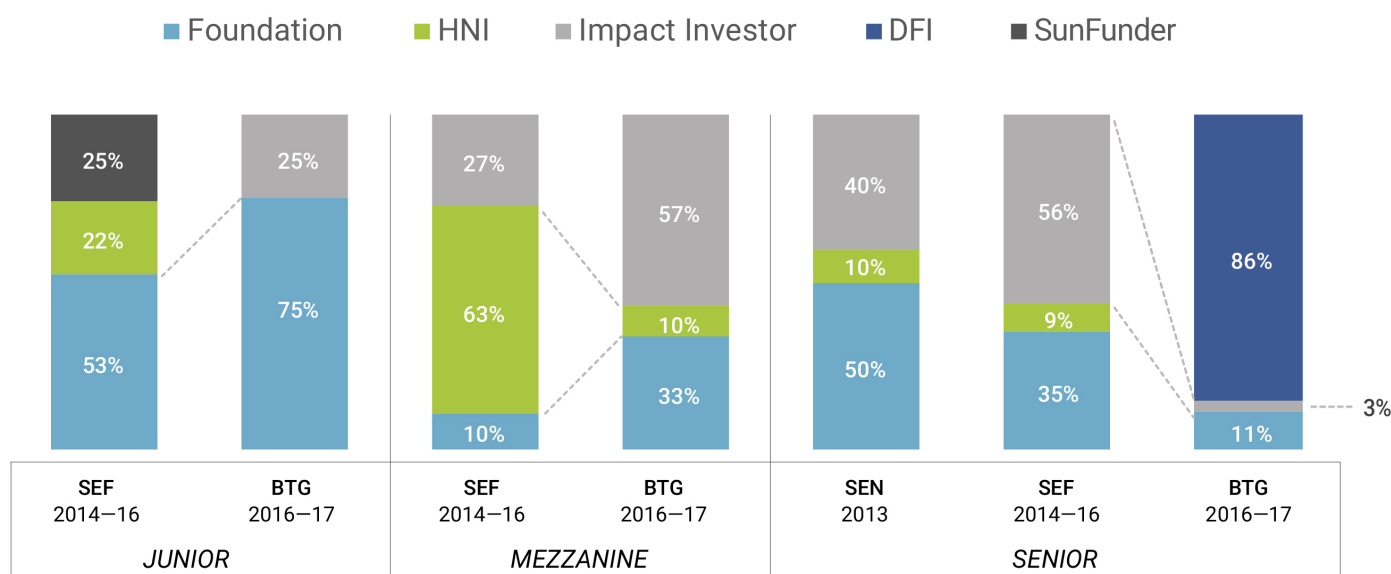


Figure 5: SunFunder debt fund investors by risk layer, 2013-17

Blending Private Finance

Blended finance is typically used to describe the pooling of public funds to mobilize private sector capital, such as the DFI investments in BTG. Until BTG, all SunFunder's blending was with different sources of private rather than public capital. This shows that offering aggregation opportunities to private investors who themselves have different risk appetites can be highly effective, particularly in the high impact sectors that public funding may struggle to find an entry point into at an early stage.

Catalytic Capital Has a Multiplier Effect

SunFunder's biggest constraint has been the relative lack of first-loss capital at workable pricing to help deliver an overall risk profile attractive to other investors. Junior first-loss capital in SunFunder's debt funds has been fundamental to their overall success by catalyzing senior and mezzanine investors further up the capital stack while delivering appropriate fund economics.

Investors that take first-loss layers in structured funds can unlock multiples of their own investment. In SunFunder's case this is best illustrated by the successive first loss grants by Facebook, which achieved 14x and (alongside The Rockefeller Foundation) 11x multipliers respectively. Commercial investors coming into the sector can be unlocked by the opportunity to hold a senior position with first-loss capital (or another form of guarantee) in place beneath them.

Tiered Fund Structure

SunFunder achieved blending through different capital layers in its funds. This has not been static, with models adapted when needed to respond to investor interests and experience. Notably, the new SET Fund has a simpler capital structure of only junior and senior layers.

Early Investors Willing to innovate

SunFunder benefited from supportive early stage investors who were willing to experiment with new fund structures, new products and an uncertain ecosystem. This includes both individuals who believed in the model before it was proven, and institutions that pioneered new innovations.

Concessional Pricing

The long-term sustainability of energy access financing relies on building a track record to enable pricing on a commercial basis—but when SunFunder started, an important feature of its initial funds was the concessional returns accepted by impact-oriented investors. Its first three note series offered a lower interest rate to senior investors than subsequent (and current) ones, enabling the company to establish its operations and fund models.

Pricing considerations are also, of course, fundamental to fund economics, which can be particularly sensitive when new types of investors join. The Packard Foundation and the Leonardo DiCaprio Foundation's program-related investments in BTG alongside Facebook's revolving grant allowed SunFunder to offer more market-reflective returns to other new investors, which will in turn build track record with them and lower risk perception of the sector more widely.

The commercial potential of the sector can prompt concessional investors to demand high returns too early, for instance through high pricing requirements or risk protection. HNIs are often less conservative than the institutions mandated to deploy catalytic capital. Concessional investors that could provide grants but expect high-interest returns from riskier debt investments should consider lower-return program-related investments as a best of both worlds.

Commercial Investors Need Comparably Higher Yields

The comparables that commercial investors use when looking at SunFunder's fixed income opportunities are high yield emerging market corporate bonds and Collateralized Leveraged Obligations (CLOs) which offer returns currently ranging from around 5 percent to 8 percent. Attracting commercial investors into the sector at scale means that catalytic capital will continue to be needed in the near term for intermediaries like SunFunder to remain competitive for solar borrowers, especially compared to other direct lending by concessional investors.

Long-Term Partnerships Allow Learning by Doing

Innovative long-term partnerships are crucial for supporting and testing new fund models. SunFunder benefited from having investors, like Facebook and DOEN Foundation, who participated multiple times and were willing to innovate as they gained first-hand experience of the company's growing track record and potential for scale.

Concessional Finance Must Minimize Distortion

As the working capital needs of the leading off-grid solar companies have reached ticket sizes of interest to larger concessional investors, including but not limited to DFIs, there is a real risk of distortion. In several cases, SunFunder has been squeezed out of deals with solar companies by non-specialist investors offering highly concessional rates directly – on more than one occasion by institutions that had also invested in SunFunder's debt funds. This hinders the sector moving to further maturity, and prolongs the need for concessional capital in financial intermediaries. This is even more the case going forward as intermediaries seek to unlock commercial capital through blended fund structures – a step that will be fundamental to the sector's long-term financing needs.



Photo credit: SunFunder borrower Harmonic Systems

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